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☐ 1. Document ID: US 20040096846 A1

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L7: Entry 1 of 53

File: PGPB

May 20, 2004

PGPUB-DOCUMENT-NUMBER: 20040096846

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040096846 A1

TITLE: Light-controlled electrokinetic assembly of particles near surfaces

PUBLICATION-DATE: May 20, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Seul, Michael	Fanwood	NJ	US	

US-CL-CURRENT: 435/6; 205/777.5, 435/7.1

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. D
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☐ 2. Document ID: US 20040072372 A1

L7: Entry 2 of 53

File: PGPB

Apr 15, 2004

PGPUB-DOCUMENT-NUMBER: 20040072372

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040072372 A1

TITLE: System and method for programmable illumination pattern generation

PUBLICATION-DATE: April 15, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Seul, Michael	Fanwood	NJ	US	
Chau, Chiu Wo	Edison	NJ	US	

US-CL-CURRENT: 436/523

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWIC	Draw. D
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☐ 3. Document ID: US 20040058887 A1

L7: Entry 3 of 53

File: PGPB

Mar 25, 2004

PGPUB-DOCUMENT-NUMBER: 20040058887

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040058887 A1

TITLE: Electroprocessing in drug delivery and cell encapsulation

PUBLICATION-DATE: March 25, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Bowlin, Gary L.	Machanicsville	VA	US	
Wnek, Gary E.	Midlothian	VA	US	
Simpson, David G.	Mechanicsville	VA	US	

US-CL-CURRENT: 514/44; 514/12, 514/54, 514/8

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw. De
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☐ 4. Document ID: US 20040038880 A1

L7: Entry 4 of 53

File: PGPB

Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040038880

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040038880 A1

TITLE: Brain associated inhibitor of tissue - type plasminogen activator

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Lawrence, Daniel A.	Derwood	MD	US	
Yepes, Manuel	Alexandria	VA	US	
Sandkvist, Maria	Derwood	MD	US	
Coleman, Timothy A.	Gaithersburg	MD	US	
Wong, Michael K.K.	Wexford	PA	US	

US-CL-CURRENT: 514/12

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw. De
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☐ 5. Document ID: US 20040037813 A1

L7: Entry 5 of 53

File: PGPB

Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040037813
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040037813 A1

TITLE: Electroprocessed collagen and tissue engineering

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Simpson, David G.	Mechanicsville	VA	US	
Bowlin, Gary L.	Mechanicsville	VA	US	
Wnek, Gary E.	Midlothian	VA	US	
Stevens, Peter J.	Richland Hills	TX	US	
Carr, Marcus E.	Midlothian	VA	US	
Matthews, Jamil A.	Glen Allen	VA	US	
Rajendran, Saravanamoorthy	East Haven	CT	US	

US-CL-CURRENT: 424/93.7; 424/443, 442/123

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 6. Document ID: US 20040037744 A1

L7: Entry 6 of 53

File: PGPB

Feb 26, 2004

PGPUB-DOCUMENT-NUMBER: 20040037744
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20040037744 A1

TITLE: Arrays formed of encoded beads having ligands attached

PUBLICATION-DATE: February 26, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Seul, Michael	Fanwood	NJ	US	

US-CL-CURRENT: 422/68.1; 422/73

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw De
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☐ 7. Document ID: US 20040034201 A1

L7: Entry 7 of 53

File: PGPB

Feb 19, 2004

PGPUB-DOCUMENT-NUMBER: 20040034201
PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040034201 A1

TITLE: Enhanced affinity hyaluronan binding peptides

PUBLICATION-DATE: February 19, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Turley, Eva	Toronto		CA	

US-CL-CURRENT: 530/388.22; 530/324

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw D
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☐ 8. Document ID: US 20040019143 A1

L7: Entry 8 of 53

File: PGPB

Jan 29, 2004

PGPUB-DOCUMENT-NUMBER: 20040019143

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040019143 A1

TITLE: Polymer composites and methods for making and using same

PUBLICATION-DATE: January 29, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Koloski, Timothy S.	West Amherst	NY	US	
Vargo, Terrence G.	Kenmore	NY	US	

US-CL-CURRENT: 524/434

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KWC	Draw D
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☐ 9. Document ID: US 20040018643 A1

L7: Entry 9 of 53

File: PGPB

Jan 29, 2004

PGPUB-DOCUMENT-NUMBER: 20040018643

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040018643 A1

TITLE: Encoded random arrays matrices

PUBLICATION-DATE: January 29, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Seul, Michael	Fanwood	NJ	US	

Chau, Chiu Wo Edison NJ US

US-CL-CURRENT: 436/523

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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☐ 10. Document ID: US 20040018226 A1

L7: Entry 10 of 53

File: PGPB

Jan 29, 2004

PGPUB-DOCUMENT-NUMBER: 20040018226

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20040018226 A1

TITLE: Electroprocessing of materials useful in drug delivery and cell encapsulation

PUBLICATION-DATE: January 29, 2004

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Wnek, Gary E.	Midlothian	VA	US	
Simpson, David G.	Mechanicsville	VA	US	
Bowlin, Gary L.	Mechanicsville	VA	US	
Yao, Li	Manchester	CT	US	
Kenawy, El-Rafaie	El-Saroe	VA	EG	
Layman, John M.	Chester	VA	US	
Sanders, Elliott H.	Richmond	VA	US	
Fenn, John	Richmond		US	

US-CL-CURRENT: 424/443

Full	Title	Citation	Front	Review	Classification	Date	Reference	Sequences	Attachments	Claims	KMC	Draw D
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File: PGPB

Nov 1, 2001

PGPUB-DOCUMENT-NUMBER: 20010036672

PGPUB-FILING-TYPE: new

DOCUMENT-IDENTIFIER: US 20010036672 A1

TITLE: Integrated nucleic acid diagnostic device

PUBLICATION-DATE: November 1, 2001

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY	RULE-47
Anderson, Rolfe C.	Mountain View	CA	US	
Lipshutz, Robert J.	Palo Alto	CA	US	
Rava, Richard P.	San Jose	CA	US	
Fodor, Stephen P. A.	Palo Alto	CA	US	

US-CL-CURRENT: 436/180; 436/53

CLAIMS:

What is claimed is:

1. A miniature fluidic system, comprising: a body having at least two discrete reaction chambers, each of said reaction chambers comprising at least one vent port, and wherein each of said reaction chambers is fluidly connected to a common chamber or channel; a pneumatic system for selectively applying a pressure differential between said common channel or chamber and at least a selected one of said at least two discrete chambers, whereby said pressure differential directs a fluid sample in said body between said common channel or chamber and said at least one selected chamber.
2. The system of claim 1, wherein said vent port comprises a gas permeable fluid barrier disposed across said vent port.
3. The system of claim 2, wherein said gas permeable fluid barrier is a hydrophobic membrane.
4. The system of claim 1, wherein at least one of said at least two chambers is a debubbling chamber, said debubbling chamber comprising at least two vent ports, one of said at least two vent ports being disposed at an intermediate position in said chamber, whereby a bubble separating at least two discrete fluid plugs in said chamber may exit said chamber allowing said at least two discrete fluid plugs to connect.
5. The system of claim 1, further comprising a controllable valve at the fluid connection between each of said at least two discrete chambers and said common channel or chamber.

6. The system of claim 5, wherein said controllable valve is a diaphragm valve.
7. The system of claim 81, wherein said pneumatic system is further capable of applying a pressure differential to said diaphragm valve to deflect said diaphragm valve.
8. The system of claim 7, wherein deflection of said diaphragm valve opens said fluid connection.
9. The system of claim 1, wherein each of said chambers has a cross sectional dimension of from about 0.05 to about 20 mm, and a depth dimension of from about 0.05 to about 5 mm.
10. The system of claim 1, wherein said at least two chambers are fluidly connected via a fluid passage, said fluid passage having a cross-sectional dimension of from about 10 μm to about 1000 μm , and a depth dimension of from about 1 to 500 μm .
11. The system of claim 1, wherein said pneumatic system comprises a pneumatic manifold for applying a differential pressure between said at least first chamber and said at least second chamber, to move said fluid sample from said at least first chamber to said at least second chamber.
12. The system of claim 1, wherein said pneumatic system comprises a differential pressure delivery system for maintaining said at least first chamber at a first pressure and said second chamber at a second pressure, said first pressure being greater than ambient pressure and said second pressure being greater than said first pressure, whereby when said second chamber is brought to ambient pressure, said first pressure forces a liquid sample in said first chamber into said second chamber.
13. The system of claim 12 wherein said differential pressure delivery system comprises: a pressure source, at least first and second passages fluidly connecting said pressure source to said at least first and second chambers, respectively; a first fluidic resistance disposed in said first passage between said pressure source and said first chamber, said first fluidic resistance transforming a pressure from said pressure source to said first pressure; a second fluidic resistance disposed in said second passage between said pressure source and said second chamber, said second fluidic resistance transforming said pressure from said pressure source to said second pressure; and first and second openable closures in said first and second chambers, respectively, whereby opening of said first or second closures allows said first or second chambers to achieve ambient pressure.
14. The miniature system of claim 13, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said first fluidic resistance having a smaller cross-sectional area than said second fluidic resistance.
15. The system of claim 1, wherein said pneumatic system comprises a differential pressure delivery system for maintaining said first chamber at a first pressure and said second chamber at a second pressure, said second pressure being less than ambient pressure and said first pressure being less than said second pressure, whereby when said first chamber is brought to ambient pressure, said second pressure draws a liquid sample in said first chamber into said second chamber.
16. The system of claim 15, wherein said differential pressure delivery system comprises: a pressure source; at least first and second passages fluidly connecting

said pressure source to said at least first and second chambers, respectively; a first fluidic resistance disposed in said first passage between said pressure source and said first chamber, said first fluidic resistance transforming a pressure from said pressure source to said first pressure; a second fluidic resistance disposed in said second passage between said pressure source and said second chamber, said second fluidic resistance transforming said pressure from said pressure source to said second pressure; and first and second openable closures in said first and second chambers, respectively, whereby opening of said first or second closures allows said first or second chambers to achieve ambient pressure.

17. The system of claim 16, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said first fluidic resistance having a larger cross-sectional area than said second fluidic resistance.

18. The system of claim 1, wherein said system further includes a temperature controller disposed adjacent at least one of said at least two chambers, for controlling a temperature within said at least one chamber.

19. The system of claim 20, wherein said temperature controller comprises a thermoelectric temperature controller.

20. The system of claim 20, wherein said temperature controller comprises a resistive heater.

21. The system of claim 22, wherein said resistive heating element is a NiCr/polyimide/copper laminate heating element.

22. The system of claim 20, further comprising a temperature sensor disposed within said temperature controlled chamber.

23. The system of claim 24, wherein said temperature sensor is a thermocouple.

24. The system of claim 25, wherein said temperature sensor is a resistance thermometer.

25. The system of claim 1, wherein at least one of said at least two chambers is a cell lysis chamber and comprises a cell lysis system disposed therein, for lysing cells in a fluid sample.

26. The system of claim 25, wherein said cell lysis system comprises an acoustic energy source disposed adjacent said cell lysis chamber.

27. The system of claim 25, wherein said cell lysis chamber includes microstructures fabricated on an internal surface of said cell lysis chamber for enhancing cell lysis.

28. The system of claim 25, wherein said cell lysis chamber includes an electrolytic pH control system for altering a pH of said cell lysis chamber.

29. The system of claim 1, wherein at least one of said at least two chambers is a hybridization chamber for analyzing a component of a fluid sample, said hybridization chamber including a polymer array, said polymer array including a plurality of different polymer sequences coupled to a surface of a single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

30. The system of claim 29, wherein said polymer array comprises at least 100 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

31. The system of claim 1, wherein said polymer array comprises at least 1000 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

32. The system of claim 29, wherein said polymer array comprises at least 10,000 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

33. The system of claim 1, wherein at least one of said at least two chambers comprises a nucleic acid amplification system.

34. The system of claim 33, wherein said nucleic acid amplification includes a system for cycling a fluid sample in said at least one chamber between at least two different temperatures.

35. The system of claim 34, wherein said system for cycling comprises at least two separate temperature controlled chambers, said at least two chambers being maintained at at least two different temperatures, whereby said sample is cycled between said at least two temperatures by moving said fluid sample back and forth between said at least two temperature controlled chambers.

36. The system of claim 1, wherein at least one of said at least two chambers comprises a nucleic acid purification system for separating nucleic acids in said sample from other contaminants in said sample.

37. The system of claim 36, wherein said nucleic acid purification system comprises a separation matrix for separating said nucleic acids from said contaminants.

38. The system of claim 37, wherein said separation matrix comprises functional groups for preferentially binding said nucleic acids in said sample.

39. The system of claim 38, wherein said functional groups comprise poly-T oligonucleotides.

40. The system of claim 37, wherein said nucleic acid purification system further comprises an electrophoretic system for applying an electric field to said fluid sample to separate said nucleic acids from said contaminants.

41. The system of claim 37, wherein said separation matrix comprises a gel matrix.

42. The system of claim 37, wherein said separation matrix comprises a membrane disposed between said sample and an anode of said electrophoretic system.

43. The system of claim 1, wherein at least one of said at least two chambers is a reverse transcription chamber, said reverse transcription chamber having disposed therein an effective amount of a reverse transcriptase enzyme and the at least four deoxynucleoside triphosphates.

44. The system of claim 1, wherein at least one of said at least two chambers is an

in vitro transcription chamber, said in vitro transcription chamber having an effective amount of an RNA polymerase and at least four different nucleoside triphosphates, disposed therein.

45. The system of claim 1, wherein at least one of said at least two chambers comprises a nucleic acid fragmentation system, for fragmenting a nucleic acid in a fluid sample.

46. The system of claim 45, wherein said fragmentation system comprises a focused piezoelectric element disposed adjacent said fragmentation chamber.

47. The system of claim 46, wherein said fragmentation system further comprises a series of microstructures fabricated on a first surface of said chamber.

48. The system of claim 45, wherein said fragmentation system comprises at least one channel through which said fluid sample is pumped, said channel having a submicron cross-sectional dimension for generating a high-shear rate.

49. The system of claim 1, further comprising a fluid mixing system for mixing said fluid sample within at least one of said at least two chambers.

50. The system of claim 49, wherein said fluid mixing system comprises a piezoelectric element disposed adjacent at least one of said at least two chambers.

51. The system of claim 49, wherein said fluid mixing system comprises a separate chamber adjacent to and fluidly connected to said at least one of said at least two chambers, whereby said fluid sample is flowed between said at least one chamber and said separate chamber to mix said fluid sample.

52. The system of claim 49, wherein said mixing system comprises: a plurality of metallic particles disposed within said at least one chamber; an electromagnetic field generator adjacent said at least one chamber, whereby when said electromagnetic field generator is activated, said metallic particles are vibrated within said at least one chamber mixing contents of said chamber.

53. The system of claim 49, wherein said mixing system mixes a fluid sample contained in a hybridization chamber.

54. The system of claim 1, wherein said fluid transport system comprises a micropump disposed in said body and fluidly connected to at least one of said plurality of chambers.

55. The system of claim 54, wherein said micropump comprises an electrophoretic pump.

56. A miniature fluidic system, comprising: a body having at least first and second chambers disposed therein, each of said at least first and second chambers having a fluid inlet and being in fluid connection, and at least one of said at least first and second chamber being a hybridization chamber for analyzing a component of a fluid sample, said hybridization chamber including a polymer array, said polymer array including a plurality of different polymer sequences coupled to a surface of a single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location; a sample inlet, fluidly connected to at least one of said first and second chambers, for introducing a fluid sample into said system; a fluid transport system for moving a fluid sample from said at least first chamber to said at least second chamber.

57. The system of claim 56, wherein said polymer array comprises at least 100 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

58. The system of claim 56, wherein said polymer array comprises at least 1000 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

59. The system of claim 56, wherein said polymer array comprises at least 10,000 different polymer sequences coupled to said surface of said single substrate, each of said plurality of different polymer sequences being coupled to said surface in a different, known location.

60. The system of claim 56, wherein said body further comprises a transparent region disposed over said hybridization chamber for detecting hybridization of a component of said fluid sample to said oligonucleotide array.

61. A miniature fluidic system, comprising: a body having at least two distinct chambers disposed therein, each of said at least two chambers being fluidly connected to at least one other of said at least two chambers; a sample inlet, fluidly connected to at least one of said at least two chambers, for introducing a fluid sample into said at least one chamber; a fluid transport system for moving a fluid sample from at least a first chamber of said at least two chambers to at least a second chamber of said at least two chambers; and a separation channel for separating a component of said fluid sample, said separation channel being fluidly connected to at least one of said chambers and including at least first and second electrodes in electrical contact with opposite ends of said separation channel for applying a voltage across said separation channel.

62. The system of claim 61, wherein at least one of said at least two chambers is an extension reaction chamber, said extension reaction chamber being fluidly connected to said separation channel, said extension reaction chamber having disposed therein one or more reagents selected from the group consisting of a DNA polymerase, deoxynucleoside triphosphates and dideoxynucleoside triphosphates.

63. The system of claim 61, further comprising at least four separation channels and at least four extension chambers, each of said separation channels being fluidly connected to a separate one of said at least four extension chambers, each of said separate extension chambers having disposed therein a different dideoxynucleoside triphosphate.

64. The system of claim 61, wherein said body further comprises a transparent region disposed over said separation channel for detecting said component of said fluid sample.

65. A miniature fluidic system, comprising: a body having at least two chambers disposed therein, at least one of said at least two chambers being an in vitro transcription reaction chamber, said in vitro transcription reaction chamber having an effective amount of an RNA polymerase and four different nucleoside triphosphates, disposed therein; a sample inlet, fluidly connected to at least one of said at least two chambers, for introducing a fluid sample into said at least one chamber; and a fluid transport system for moving a fluid sample from at least a first of said at least two chambers to at least a second chamber of said at least two chambers.

66. A miniature fluidic system, comprising: a body having at least two chambers

disposed therein, at least one of said at least two chambers being a cell lysis chamber, for lysing cells in said fluid sample, said cell lysis chamber comprising a cell lysis system; a sample inlet, fluidly connected to at least one of said at least two chambers, for introducing a fluid sample into said at least one chamber; and a fluid transport system for moving a fluid sample from at least a first of said at least two chambers to at least a second chamber of said at least two chambers.

67. The system of claim 66, wherein said cell lysis system comprises a series of microstructures fabricated on an internal surface of said lysis chamber, whereby flowing said fluid sample over said microstructures results in lysis of cells in said fluid sample.

68. The system of claim 67, wherein said cell lysis system further comprises a piezoelectric element disposed adjacent said cell lysis chamber for flowing said fluid sample over said microstructures.

69. The system of claim 67, wherein said cell lysis chamber comprises an electrolytic pH control system, for altering a pH in said cell lysis chamber.

70. A miniature fluidic system, comprising: a body having at least two chambers disposed therein, at least one of said at least two chambers being a nucleic acid purification chamber, for separating nucleic acids in said fluid sample from other contaminants in said fluid sample; a sample inlet, fluidly connected to at least one of said at least two chambers, for introducing a fluid sample into said at least one chamber; and a fluid transport system for moving said separated nucleic acids from said nucleic acid chamber to said at least a second chamber of said at least two chambers.

71. The system of claim 70, wherein said nucleic acid purification system comprises a separation matrix which selectively binds nucleic acids in said fluid sample, but not said other contaminants.

72. The system of claim 71, wherein said matrix comprises a silica matrix.

73. The system of claim 72, wherein said silica matrix comprises glass wool.

74. The system of claim 71, wherein said matrix comprises a solid support having poly-T oligonucleotides coupled to said solid support.

75. A miniature fluidic system, comprising: a body having at least a first chamber fluidly connected to a second chamber by a fluid passage; a sample inlet, fluidly connected to said first chamber, for introducing a fluid sample into said system; a differential pressure delivery system for maintaining said first chamber at a first pressure and said second chamber at a second pressure, said first pressure being greater than ambient pressure and said second pressure being greater than said first pressure, whereby when said second chamber is brought to ambient pressure, said first pressure forces a liquid sample in said first chamber into said second chamber.

76. The system of claim 75, wherein said differential pressure delivery system comprises: a pressure source; at least first and second passages fluidly connecting said pressure source to said at least first and second chambers, respectively; a first fluidic resistance disposed in said first passage between said pressure source and said first chamber, said first fluidic resistance transforming a pressure from said pressure source to said first pressure; a second fluidic resistance disposed in said second passage between said pressure source and said

second chamber, said second fluidic resistance transforming said pressure from said pressure source to said second pressure; and first and second openable closures in said first and second chambers, respectively, whereby opening of said first or second closures allows said first or second chambers to achieve ambient pressure.

77. The system of claim 76, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said first fluidic resistance having a smaller cross-sectional area than said second fluidic resistance.

78. The system of claim 76, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said fluid passages of said first fluidic resistance having a greater length than said fluid passages of said second fluidic resistance.

79. A miniature fluidic system, comprising: a body having at least a first chamber fluidly connected to a second chamber; a sample inlet, fluidly connected to said first chamber, for introducing a fluid sample into said at first chamber; a differential pressure delivery source for maintaining said first chamber at a first pressure and said second chamber at a second pressure, said second pressure being less than ambient pressure and said first pressure being less than said second pressure, whereby when said first chamber is brought to ambient pressure, said second pressure draws a liquid sample in said first chamber into said second chamber.

80. The system of claim 79, wherein said at least a first chamber is fluidly connected to said second chamber by a fluid passage.

81. The system of claim 80, wherein said differential pressure delivery system comprises: a pressure source; at least first and second passages fluidly connecting said pressure source to said at least first and second chambers, respectively; a first fluidic resistance disposed in said first passage between said pressure source and said first chamber, said first fluidic resistance transforming a pressure from said pressure source to said first pressure; a second fluidic resistance disposed in said second passage between said pressure source and said second chamber, said second fluidic resistance transforming said pressure from said pressure source to said second pressure; and first and second openable closures in said first and second chambers, respectively, whereby opening of said first or second closures allows said first or second chambers to achieve ambient pressure.

82. The system of claim 81, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said first fluidic resistance having a larger cross-sectional area than said second fluidic resistance.

83. The system of claim 81, wherein said first and second fluidic resistances independently comprise one or more fluid passages connecting said first and second passages to said first and second chambers, said first fluidic resistance comprising passages having a shorter length than said channels of said second fluidic resistance.

84. A method of directing a fluid sample in a miniature fluidic system, comprising: providing a microfabricated device having at least first and second chambers disposed therein, wherein each of said at least first and second chambers is in fluid connection with a common chamber or channel, has at least first and second controllable valves disposed across said fluid connection, respectively, and includes at least one vent; applying a positive pressure to said common chamber or

channel; selectively opening said at least first controllable valve, whereby said positive pressure forces said fluid sample from said common chamber or channel into said first chamber.

85. The method of claim 84, further comprising applying a positive pressure to said at least first chamber and selectively opening said at least first controllable valve, whereby said positive pressure forces said fluid sample from said at least first chamber into said common chamber or channel.

86. The method of claim 85, wherein said vent comprises a hydrophobic membrane sealably disposed across said vent, whereby when said fluid sample contacts said hydrophobic membrane, flowing of said fluid sample into said at least first chamber stops.

87. The method of claim 84, wherein said at least first and second controllable valves are selectively opened pneumatically.

88. A method of mixing at least two discrete fluid components in a microfabricated fluidic system, comprising: providing a microfabricated channel having a vent disposed at an intermediate location in said channel, said vent having a gas permeable fluid barrier disposed across said vent; introducing said at least two discrete fluid components into said channel separated by a gas bubble; flowing said at least two fluid components past said vent, whereby said bubble exits said vent, allowing said at least two fluid components to mix.

89. The method of claim 88, wherein said gas permeable fluid barrier is a hydrophobic membrane.

90. A method of repeatedly measuring a known volume of a fluid in a miniature fluidic system, comprising: providing a microfabricated device having at least first and second chambers disposed therein, wherein said at least first and second chambers are in fluid connection, each comprise at least one vent port, and wherein at least one of said chambers is a volumetric chamber having a known volume; filling said volumetric chamber with said fluid to create a first aliquot of said fluid; transporting said first aliquot of said fluid to said at least second chamber; and repeating said filling and transporting steps.

91. The method of claim 90, wherein each of said chambers of said device provided in said providing step has a cross sectional dimension of from about 0.05 to about 20 mm, and a depth dimension of from about 0.05 to about 5 mm.

Text (155):

FIG. 12 shows a schematic illustration of a device configuration for performing sample preparation reactions, generally, utilizing the fluid direction systems described herein, e.g., employing external pressures, hydrophobic vents and pneumatic valves. In the configuration shown, four domains of the device are each addressed by an array of valves, e.g., a valve array, with its own common channel. The four domains may generally be defined as: (1) reagent storage; (2) reaction; (3) sample preparation; and (4) post processing, which are fluidically interconnected. The sample preparation domain is typically used to extract and purify nucleic acids from a sample. As shown, included in the sample preparation domain are 5 reagent inlets that are fluidly connected to larger volume storage vessels, e.g., within the base unit. Examples of such reagents for extraction reactions may include, e.g., 4M guanidine isothiocyanate, 1.times.TBE and 50:50 EtOH:H.sub.2 O. The two reaction chambers may include, e.g., affinity media for purification of nucleic acids such as glass wool, or beads coated with poly-T oligonucleotides.

pparatus for conducting chemical or biochemical
 reactions on a solid surface within an enclosed
 chamber
 INVENTOR(S): Schembri, Carol T.; Overman, Leslie B.; Hotz, Charles
 Z.
 PATENT ASSIGNEE(S): Agilent Technologies Inc., USA
 SOURCE: U.S., 17 pp.
 CODEN: USXXAM
 DOCUMENT TYPE: Patent
 LANGUAGE: English
 FAMILY ACC. NUM. COUNT: 1
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 6258593	B1	20010710	US 1999-343372	19990630
US 2002001839	A1	20020103	US 2001-900294	20010706

PRIORITY APPLN. INFO.: US 1999-343372 XX 19990630

AB The invention provides an apparatus and method for conducting chemical or
 biochem.
 reactions on a solid surface within an enclosed chamber. The invention
 may be used in conducting hybridization reactions, as of biopolymers such
 as DNA, RNA, oligonucleotides, peptides, polypeptides, proteins,
 antibodies, and the like. In another aspect, the invention provides an
 improved method for mixing a thin film of solution, as in a hybridization
 chamber. The invention further provides a kit for carrying out the
 methods of the invention. In a **nucleic acid**
 hybridization assay, background interference was low when hybridization
 solution containing 1 weight% Triton X-100 was used.

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THI

L4 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:499793 CAPLUS
DOCUMENT NUMBER: 135:89490
TITLE: Apparatus for conducting chemical or biochemical reactions on a solid surface within an enclosed chamber
INVENTOR(S): Schembri, Carol T.; Overman, Leslie B.; Hotz, Charles Z.
PATENT ASSIGNEE(S): Agilent Technologies Inc., USA
SOURCE: U.S., 17 pp.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PRIORITY APPLN. INFO.: US 1999-343372 XX 19990630

AB The invention provides an apparatus and method for conducting chemical or biochem.

reactions on a solid surface within an enclosed chamber. The invention may be used in conducting hybridization reactions, as of biopolymers such as DNA, RNA, oligonucleotides, peptides, polypeptides, proteins, antibodies, and the like. In another aspect, the invention provides an improved method for mixing a thin film of solution, as in a hybridization chamber. The invention further provides a kit for carrying out the methods of the invention. In a **nucleic acid** hybridization assay, background interference was low when hybridization solution containing 1 weight% Triton X-100 was used.

REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 2 BIOTECHDS COPYRIGHT 2004 THOMSON DERWENT/ISI on STN

DUPLICATE 1

ACCESSION NUMBER: 2000-09837 BIOTECHDS
TITLE: Reducing cross-contamination of an assay reagent solution by coating a solid support with a **non-stick** material prior to contacting the solid support with a first reagent solution, useful for detecting target analytes; detection of **nucleic acid** by hybridization to a DNA probe array coated in a **non-stick** material to prevent cross-contamination between test samples.

AUTHOR: Haydock P V; Ray J D
PATENT ASSIGNEE: Saigene
LOCATION: Redmond, WA, USA.
PATENT INFO: WO 2000026410 11 May 2000
APPLICATION INFO: WO 1999-US25653 2 Nov 1999
PRIORITY INFO: US 1998-106857 3 Nov 1998
DOCUMENT TYPE: Patent
LANGUAGE: English
OTHER SOURCE: WPI: 2000-365645 [31]

AN 2000-09837 BIOTECHDS

AB A means of reducing cross-contamination of an assay reagent solution is claimed. It involves contacting a solid support with a 1st reagent solution, removing the solid support from contact with that solution, and then brining it into contact with a 2nd reagent solution. Cross-contamination of the 2nd solution by the 1st is reduced by coating the solid support with **non-stick** material before it is contacted with the 1st solution. Also claimed is a means of detecting

a target analyte in a test sample, and an apparatus used to detect a target analyte, consisting of a solid support attached to a capture reagent that binds to the target analyte. This is used to reduce cross-contamination of reagents in a variety of assays and experiments that involve the transfer of a solid support from one reagent to another. The assay are particularly used for the detection of a target analyte, particularly a **nucleic acid** such as DNA or RNA. This method reduce or eliminates drop-outs and substrate precipitation caused by carry-over between wells. (39pp)

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13: Entry 14 of 14

File: USPT

Jul 13, 1999

Logout

DOCUMENT-IDENTIFIER: US 5922591 A

TITLE: Integrated nucleic acid diagnostic device

Detailed Description Text (81):

The surfaces of the fluid channels and reaction chambers which contact the samples and reagents may also be modified to better accomodate a desired reaction. Surfaces may be made more hydrophobic or more hydrophilic depending upon the particular application. Alternatively, surfaces may be coated with any number of materials in order to make the overall system more compatible to the reactions being carried out. For example, in the case of nucleic acid analyses, it may be desireable to coat the surfaces with, e.g., a teflon or other non-stick coating, to prevent adhesion of nucleic acids to the surface. Additionally, insulator coatings may also be desirable in those instances where electrical leads are placed in contact with fluids, to prevent shorting out, or excess gas formation from electrolysis. Such insulators may include those well known in the art, e.g., silicon oxide, ceramics or the like. Additional surface treatments are described in greater detail below.